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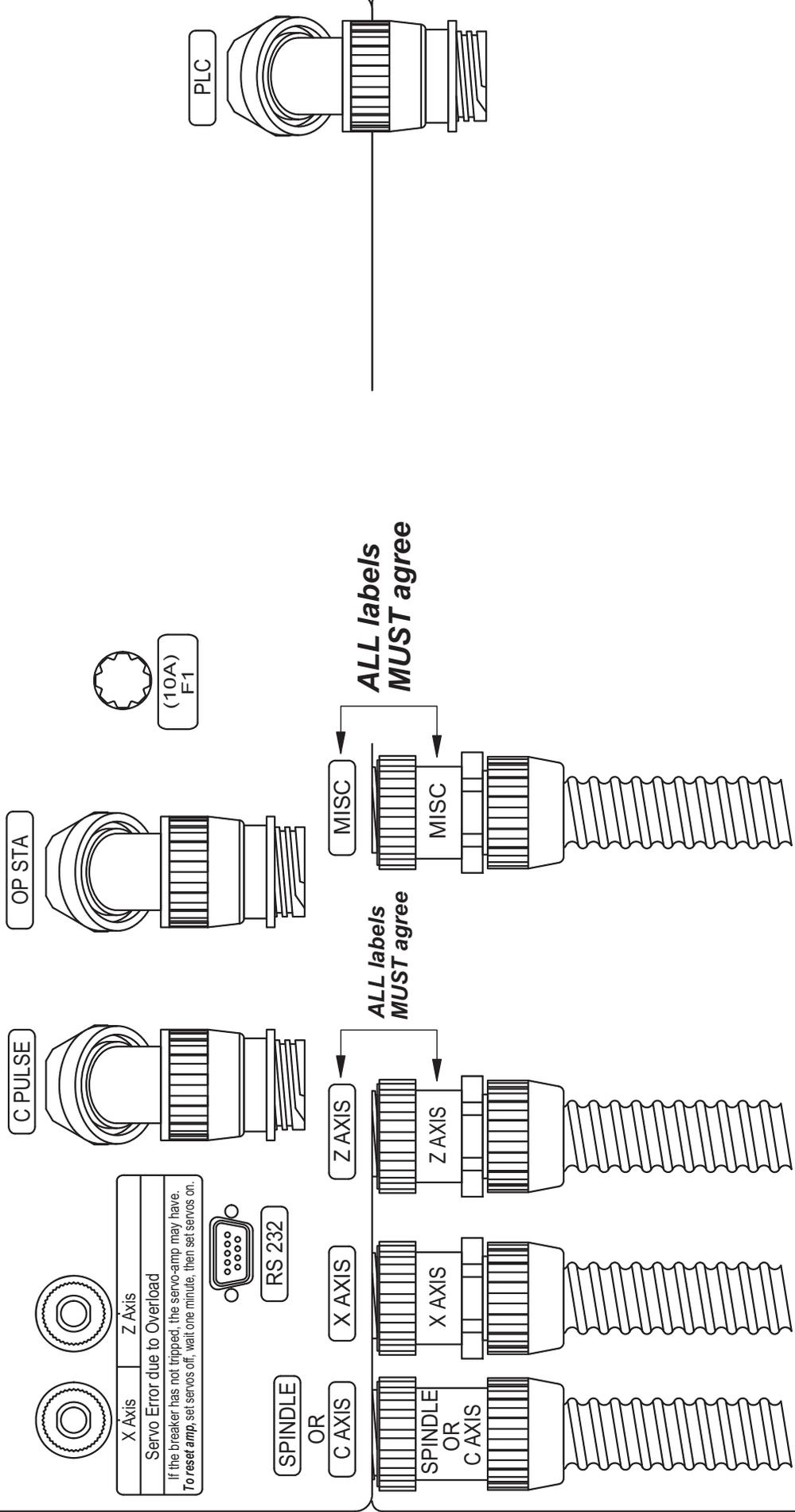
Packing List for G4 Yaskawa

Parts	Express Box 1:	Included
	OmniTurn Programming & Service Manual	
	Installation Instructions	
	8 ea. 7.5" cable ties	
	4 ea. 8-32 nuts	
	5" jumper	
	2" jumper	
	USB flash drive	

Express Box 2:		
	14 pin to 16 pin C axis Adapter Cable	
	YASRETRO PCB Board	
	C PULSE cable	
	Op Station Extension cable Connected to Op Sta - back of CNC control	
	Ethernet loop-back test plug Located inside of CNC control On back of LCD	
	MISC. PLUG Pre-connected to MISC. on back of control Must save this plug- store inside CNC control	

NC Electronics 42820 Port Orford Loop, Port Orford Oregon 97526

CAUTION! Check ALL cables BEFORE POWER ON!



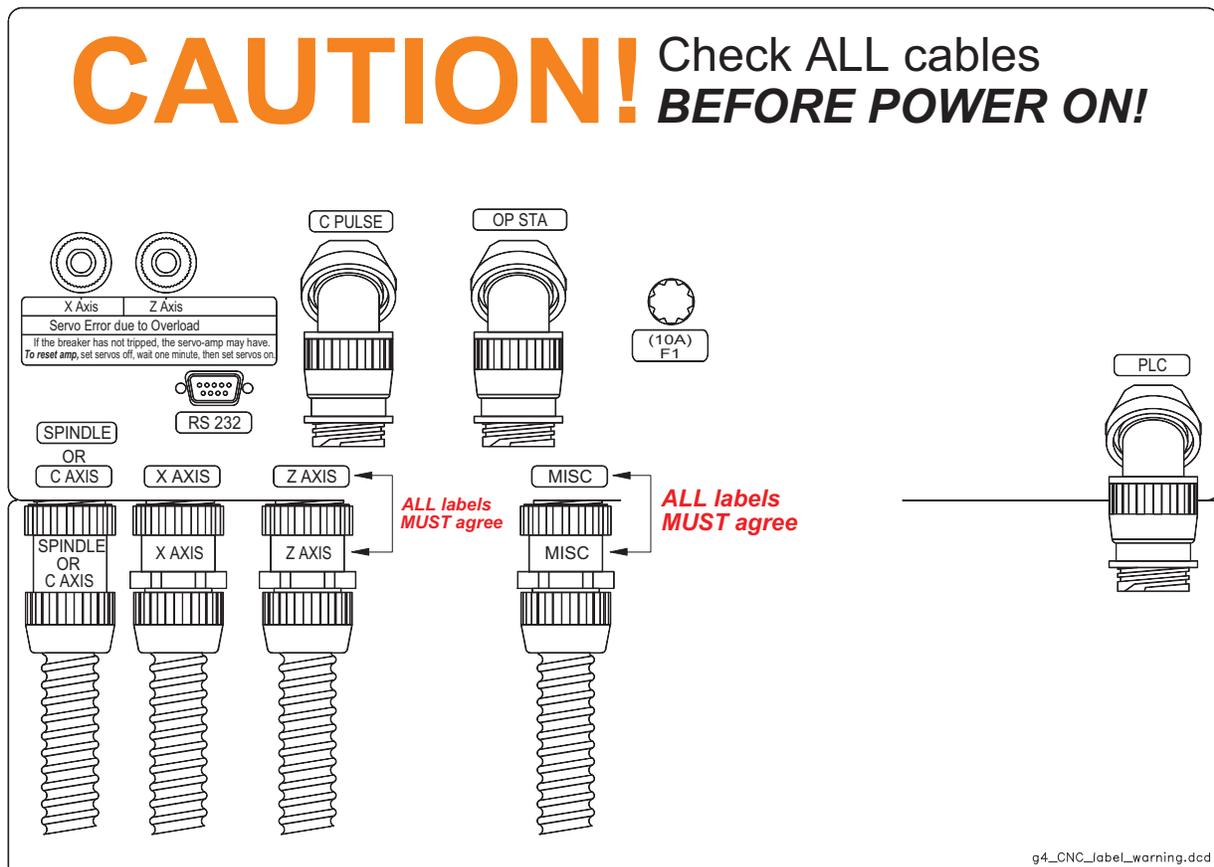
Be Careful!

Before you disconnect your old control, check to make sure that each cable is marked with the socket that it is connected to (X Axis, Z Axis, Spindle, Misc, and C Axis if applicable). If the original markings are not legible, make labels with masking tape or something similar and mark the cables as you remove them so that you will be sure you know where they belong. Plugging cables into the wrong sockets on the new control can cause serious damage, which will not be covered by warranty.

Make sure that the jumpers on the electrical panel are installed on the correct terminals. Terminal 1 is at the top of the terminal strip, and terminal 30 is at the bottom.

Be sure to disconnect your Operator's Station (palm box) from the main electrical cabinet and plug it into the Op. Sta. connector on the back of the control using the provided extension cable.

Do not turn the new control on until you are certain that each cable is in its proper socket and each jumper is on the correct terminals. If you have any doubts, call us at 541/332-7004 before turning the control on.



Omniturn

Phone 541/332 7004 Fax 541/332 1018

Installing the G4 control on a Yaskawa C-axis

Cabling Changes:

1. Shut off all power to the machine.
2. Make sure that the markings on all the cables connected to the original control are legible. If any of the cables are not clearly marked, label them with masking tape or some other convenient method.
3. Remove the upper piece of sheet metal on the right end of the machine (as viewed from the front).
4. Unplug the cables from the control.
5. Remove the control, along with its wedge-shaped mount, from the top of the machine by removing the 4 cap screws that hold the mount to the top of the machine.
6. Transfer the mount to the new control and mount the new control to the top of the machine. Cut any cable ties that prevent the control cables from being pulled down through the top sheet metal and pull the cables down.
7. Attach the short adapter cable (provided) to the C AXIS connector on the new control. The C AXIS and MISC cable will also need to be pulled down through the hopper to make room for the new cables that will need to be run through the same holes.
8. Connect the provided CPULSE and OP STA cables to the corresponding connectors on the new control and drop them down through the top sheet metal and the hopper. The CPULSE cable has a large flexible grommet attached. This grommet will need to be pushed through the holes in both the top sheet metal and the hopper.
9. Once the CPULSE and OP STA cables have been dropped through the sheet metal into the area next to the coolant tank, the C AXIS and MISC cable can be pushed back up and connected to the new control. Connect the X and Z axis cables as well.
 - a. The original Spindle encoder cable is no longer used. The encoder itself can be removed and kept as a spare for another machine.
 - b. The original RS232 cable is no longer required.
10. Run the new cables back along the rear frame rail to the main electrical box. Secure the new cables to the existing cables on the frame rail with cable ties.
11. Unplug the remote operator's station from the OP STA connector on the main electrical box. Remove the 4 screws surrounding this connector and push the connector inside the electrical box.
 - a. Connect the remote operator's station to the new OP STA cable and feed the new CPULSE cable into the main electrical box through the hole vacated by the old OP STA connector.
 - b. Use the grommet on the CPULSE cable to seal the hole.
 - c. Reinstall the screws that held the old OP STA connector to the box, using the nuts provided to secure them.
12. Unplug the MISC cable from the MISC connector on the main electrical box.

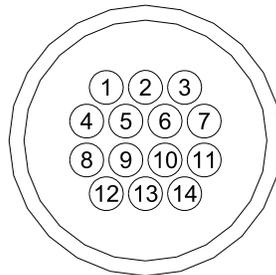
Installing the G4 control on a Yaskawa C-axis, *con't*

Spindle Cabinet Changes:

1. Inside the electrical box, unplug the connector from CN1 on the Yaskawa servo amplifier. This connector has locking tabs which are released by squeezing the release levers in the finger-grip areas on the connector shell.
2. Connect the new YASRETRO circuit board to CN1 and connect the cable that was removed from CN1 to the CN2 connector on the YASRETRO board.
3. Connect the CPULSE cable which you previously routed into the box to the CN3 connector on the YASRETRO board.

Wiring the MISC connector:

1. The connector on the CPULSE cable also has a yellow wire and a black-white pair with female pins attached connected to it. These wires must be inserted into the MISC connector, which is located on the back wall of the box, above the spindle panel. The pins are arranged in the connector as shown below (as viewed from the inside of the electrical box):



2. Insert the yellow wire into pin 4 in the MISC connector.
3. Insert the white wire from the black-white pair onto pin 10 in the MISC connector.
4. Insert the black wire into pin 11.

TB1 Connections

1. Install the longer red jumper wire provided between TB1 terminal 13 and TB1-4. TB1 is the long terminal strip that goes down the left side of the electrical panel.
2. Install the shorter jumper from TB1-30 to the mounting screw just below it.
3. Plug the MISC cable back in to the MISC connector on the electrical box.

This completes the physical installation.

Leave the sheet metal panel off the right end of the machine until the machine is up and running.

Apply power to the machine.

Installing the G4 control on a Yaskawa C-axis, *con't*

Re-programming the Yaskawa Servo Amplifier

First, you will need to restore the amp to its factory settings. Pressing the MODE/SET button below the digital display steps the amp through its various display modes.

Press the MODE/SET button and the display will show *Fn000*. When *Fn000* is displayed, press the ▲ button until the display reads *Fn005*. When *Fn005* is displayed, press and hold the DATA/< key until the display reads *P.InIt*. Then press the MODE/SET key and *P.InIt* will flash for a while, then briefly display *donE*. Press and hold DATA/< for a second and the display will return to *Fn005*. The parameters are now returned to factory defaults.



Digital Display

To set the parameters to the new values, you will need to follow this general procedure:

- Press the MODE/SET key to get to the parameter display: *Pn000*
- Press the DATA/< key to select the digit to be changed
- Press the ▲ or ▼ key to change the value of the selected (flashing) digit.

Pressing and holding the DATA/< key will change from displaying the parameter number to displaying the value of that parameter, or vice versa. After the parameters have been changed, turn the main power off for at least 10 seconds, then back on to make the changes effective.

Parameter settings (each of the following 13 parameters must be set according to the procedure above):

Drive mode selection

Pn000=0070 (switch between velocity/position servo modes via P-CON signal)

Servo/speed loop settings

Pn100=100 (speed loop gain)

Pn101=1140 (time constant)

Pn102=90 (pos. loop gain)

Pn103=50(inertia ratio)

Position control settings

Pn200=0000 (selects pulse/direction format)

Pn201=1000 (sets feedback as 1000 line encoder)

Pn202=32768 (electronic gearing numerator)

Pn203=9000 (electronic gearing denominator)

Speed control settings

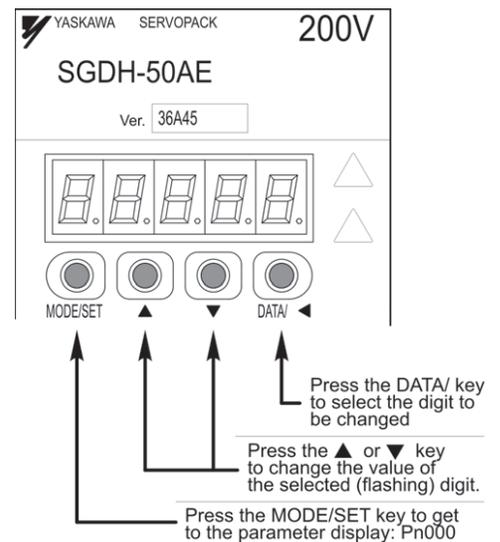
Pn305,306=1000 (accel/decel)

Pn300=625 (speed command scaling)

General

Pn600=25 (brake resistor setting)

Pn110=12 (auto-tuning disabled)

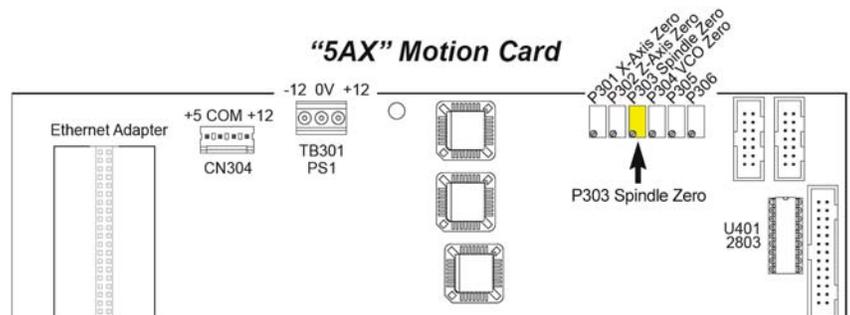


Set power off after setting parameters.

Set power on.

In MDI mode, issue M03 S0.

Adjust P303 (Spindle Zero) on 5AX Motion Card for zero speed.



This concludes the installation.

Changes in G4 Control Compared to G3

Most of the commands and functions of the G4 control are the same, and accessed by the same keystrokes, as the G3. The display has been redesigned to present more information and present the information more clearly and consistently. Listed below are the highlights.

Jog Mode

The Position display now reflects tool selection. When a tool is selected (by pressing "T" and entering the number, just as on the old control) the coordinates displayed are those associated with the selected tool (work coordinates), and the X value is the diameter value rather than the distance from home. To put the display back into machine coordinate mode, select tool 0.

Manual Data Input (MDI) is now a part of Jog mode, rather than a separate mode of its own. MDI mode allows basic operations such as the exercising of M functions and simple positioning moves. Canned cycles such as threading or drill cycles are not supported in MDI.

On machines equipped with a C axis, the *C axis is enabled in Jog mode by pressing Alt-C*. The C axis will home itself when it is enabled. The C axis can be jogged the same as X or Z and pressing Alt-H with the C axis enabled will set the current position as C axis home position. After setting this position, M19 will index the C axis to this position whether in Jog or Automatic mode. When C axis is enabled, pressing Alt-C again will disable it.

Auto Mode is entered by pressing A from Jog Mode. It is no longer necessary to press Esc to get out of Jog mode. If no program has been selected, a file-picking screen will come up and you must choose or create a part program before going to Auto.

Auto Mode

A distance-to-go display has been added in the upper left corner of the screen. Previous, current and next program lines are displayed. The active tool number is also displayed.

Tool offsets can be adjusted at program stops or anytime the machine is not in cycle.

Sequence Search now presents a list of the tool calls in the order in which they appear in the program. When you select a search point from this list, you will be prompted with a list of the M-functions which will be enabled. Pressing Cycle Start will turn these functions on, and program execution will begin in Single Block mode. Note that PLC (user-defined) m-functions are not recognized by sequence search mode. If there is only one tool in the program, sequence search is pointless, so no search points will be displayed.

To copy all program files to G4 CNC from a USB stick

Current versions of the G4 CNC have no floppy drive; you must first copy your program files from your backup floppy disk to a USB stick using your desktop computer equipped with floppy drive.

If your backup is not current, put a blank floppy disk in your old control, turn it on, then press 'Y' at the "Do you want to backup your files" prompt.

Plug in the USB stick with your user programs *before* you turn on the CNC. If the CNC is on, turn it off, then install the stick.

Turn the control on: at the "OmniTurn CNC" screen, press and hold the Ctrl key, then press the "C" key (Ctrl-C). (Ctrl key is at extreme lower-left corner of keyboard).

You should see the prompt **K: \CNC>** Type **C**: then press Enter.

You should now see the prompt **C: \RUNFILES>**. Type **CD \PROGRAMS** and Enter.
Note that '\ ' (backslash) is NOT the '/' under the '?'.

You should now see the **C: \PROGRAMS>** prompt. At this prompt, type **COPY D: *.*** then press Enter. All your files will be copied into the new CNC.

After the files have been copied, set the CNC *off*, wait a few seconds, then *on* to reboot.

No Operator's Station (Palm Box)

The G4 CNC has dual cycle-start buttons, so operator safety is enhanced by requiring both hands to be out of the cutting area in order to start the cycle. In order to operate without Operator's Station installed, a 'jumper' must be added to the E-Stop switch on the CNC. The picture at the right illustrates jumper installation.



The Operator's Station can provide more convenient, waist-level, two-handed operation, with additional collet open and close buttons plus another e-stop switch. Available from stock for \$395. Part number 998-00-000.

